PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Artcle 36 and Rule 70)

Applicant's or agent's file reference 4FPO-08-23	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. **PCT/KR2004/002247**	International filing date *(day/month/year)* **04 SEPTEMBER 2004 (04.09.2004)**	Priority date *(day/month/year)* 04 SEPTEMBER 2003 (04.09.2003)

International Patent Classification (IPC) or national classification and IPC

IPC7 A61K 31/352, C07D 311/30, A61P 1/04

Applicant

Dong-A Pharmaceutical Co., Ltd. et al

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☐ (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:
   - ☒ Box No. I Basis of the report
   - ☐ Box No. II Priority
   - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - ☒ Box No. IV Lack of unity of invention
   - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - ☐ Box No. VI Certain documents cited
   - ☐ Box No. VII Certain defects in the international application
   - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demamd	Date of completion of this report
30 JUNE 2005 (30.06.2005)	10 AUGUST 2005 (10.08.2005)
Name and mailing address of the IPEA/KR Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer LEE, Mi Jeong Telephone No. 82-42-481-5601

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Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☒ This report is based on translations from the original language into the following language English, which is the language of a translation furnished for the purposes of:

   ☐ international search (under Rules 12.3 and 23.1(b))
   ☒ publication of the international application (under Rule 12.4)
   ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this reort as "originally filed" and are not annexed to this report):*

   ☐ the international application as originally filed/furnished

   ☐ the description:
   pages _____ as originally filed/furnished
   pages* _____ received by this Authority on _____
   pages* _____ received by this Authority on _____

   ☐ the claims:
   pages _____ as originally filed/furnished
   pages* _____ as amended (together with any statment) under Article 19
   pages* _____ received by this Authority on _____
   pages* _____ received by this Authority on _____

   ☐ the drawings:
   pages _____ as originally filed/furnished
   pages* _____ received by this Authority on _____
   pages* _____ received by this Authority on _____

   ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:
   ☐ the description, pages _____
   ☐ the claims, Nos. _____
   ☐ the drawings, sheets _____
   ☐ the sequence listing *(specify)* : _____
   ☐ any table(s) related to sequence listing *(specify)* : _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   ☐ the description, pages _____
   ☐ the claims, Nos. _____
   ☐ the drawings, sheets _____
   ☐ the sequence listing *(specify)*: _____
   ☐ any table(s) related to sequence listing *(specify)* : _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

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Box No. IV Lack of unity of invention

1. ☐ In response to the invitation to restrict or pay additional fees the applicant has, within the applicable time limti:
   - ☐ restricted the claims
   - ☐ paid additional fees
   - ☐ paid additional fees under protest and, where applicable, the protest fee
   - ☐ paid additional fees under protest but the applicable protest fee was not paid
   - ☐ neither restricted nor paid additional fees.
2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is :
   - ☐ complied with.
   - ☒ not complied with for the following reasons:

This application consists of two groups of inventions as follows:

Group I : Claims 1-3, 9-15 are directed to the monohydrate of 7-carboxymethyloxy-3',4',5-trimethoxyflavone, preparation method and uses thereof.

Group II : Claims 4-8 are directed to the preparation method of 7-carboxymethyloxy-3',4',5-trimethoxyflavone(nonhydrate).

The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because Group II does not have the technical feature regarding monohydrate of formula 1 which Group I has.

4. Consequently, this report has been established in respect of the following parts of the international application :
   - ☒ all parts.
   - ☐ the parts relating to claims Nos.

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1 - 15	YES
	Claims		NO
Inventive step (IS)	Claims	1 - 15	YES
	Claims		NO
Industrial applicability (IA)	Claims	1 - 15	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The following documents are referred to in this report:

D1: Arch. Pharm. Res. Vol.22(4), pp.354-360 (1999)
D2: US 6025387 (15 Feb. 2000)
D3: US 5399584 (21 Mar. 1995)
D4: EP 505937 A1 (30 Sep. 1992)

1. Novelty

Claims 1-3 and claims 9-15 of the present invention relate to a monohydrate of 7-carboxymethyloxy-3',4',5-trimethoxyflavone, a preparation method thereof and a pharmaceutical composition comprising the same. Claims 4-8 of the present invention relate to a preparation method of 7-carboxymethyloxy-3',4',5-trimethoxyflavone with no pressure and no column chromatography.

D1 discloses the effect of 7-carboxymethyloxy-3',4',5-trimethoxyflavone on experimental animal models of inflammatory bowel disease. D2 discloses gastroprotective flavone/flavanone compounds including 7-carboxymethyloxy-3',4',5-trimethoxyflavone with therapeutic effect on inflammatory bowel disease.
D3 discloses the use of flavone derivatives for gastroprotection.
D4 discloses flavone derivatives, a process for the preparation thereof and pharmaceutical compositions comprising them.

None of D1-D4 discloses the said monohydrate, a preparation method thereof and a pharmaceutical composition comprising the same in claims 1-3 and 9-15 of the present invention.
Thus, claims 1-3 and claims 9-15 of the present invention are considered to be novel over D1-D4.

None of D1-D4 discloses the said preparation methods in claims 4-8 of the present invention.
Therefore, claims 4-8 of the present invention are considered to be novel over D1-D4 [Article 33(2) PCT]. (Continued on Supplemental Sheet.)

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Box V.

2. Inventive Step

There is no implication or suggestion to lead those who skilled in the art to expect that the monohydrate of 7-carboxymethyloxy-3',4',5-trimethoxyflavone has more favorable physicochemical properties than the nonhydrate of 7-carboxymethyloxy-3',4',5-trimethoxyflavone in D1-D4.

Thus, the inventive step of claims 1-3 and claims 9-15 can be acknowledged over D1-D4.

There is no implication or suggestion to lead those who skilled in the art to expect that 7-carboxymethyloxy-3',4',5-trimethoxyflavone(nonhydrate) can be synthesized with no pressure and no column chromatography.

Therefore, the inventive step of claims 4-8 can be acknowledged over D1-D4 [Article 33(3) PCT].

3. Industrial Applicability

The subject-matter of claims 1-15 appears to be industrially applicable [Article 33(4) PCT].